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ABSTRACT

To maximize efficiency and minimize cost, purchasing departments are using computers to issue purchase orders, expedite orders, and control inventory. In order to familiarize prospective users, explanations of some of the terminology, equipment, and other pertinent facts associated with automation are supplied. Six pages, in outline form, explain computer systems, hardware, software, components, and how the computer works. General information (configuration, capabilities, applications, maintenance, operation, equipment availability, cost, and vendors) is presented about microcomputers, minicomputers, and maxicomputers. (MLF)

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COMPUTERIZED PURCHASING

by

John M. Mazurek

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Computerization and office automation are no longer Space Age technologies reserved for elite organizations such as NASA, Boeing and General Motors.

What used to be the labor of adding machines, calculators, mimeograph machines, transcribers, editers and secretaries is now the ease of CPU's, Word Processors and high speed laser printers.

Industry, the Government, the family and, more predominately, the educational environment is showing an increasingly strong dependency on the efficiency of the computer.

It is no wonder then, that in this day of maximization of efficiency and minimization of cost, the watchdog of utilization, the purchasing department, would be in quest of simplifying methods and procedures to produce maximum output. The evolution of the advanced purchasing department is to proliferate from a labor intensified, slow manual operation to an automated computerized productive department.

Before entering into specific applications of computers in the purchasing department, one should familiarize himself with some of the terminology, equipment and other pertinent facts associated with automation:

1. Computer Systems
   - A. Hardware
     1. Introduction

        First computers introduced in the 1940's were gymnasium size relatively slow and unreliable.

        Three types of computers have now been evolved:

        a. Maxi computers
           - Commonly called 'main frame' computers the size has been reduced greatly and speeds are extremely fast due to integrated circuitry technology.
           - Greater reliability.
           - Used mainly in large business and research operations because of costs ranging from $500,000 to $5,000,000.

        b. Mini computers
           - Introduced in the late 1960's.
           - Approximately desk size.
           - Used primarily in small and medium size businesses they are

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popular in science and research because of extremely fast computation speeds.

- Costs range from $5,000 to $500,000.

C. Micro computers.

- Introduced in the early 1970's.
- Used in small business and professional operations, i.e. medical and law offices.
- Original market was the home as 'personal computers' where it is still very popular.
- Desk top size.
- Costs range from $500 to $5,000.

2. Components

a. The heart of all computers is the Central Processing Unit

- The CPU is made up of three components:
  1. Control Unit - coordinates the operation of the computer.
  2. Arithmetic/Logic Unit - performs simple logic, i.e., A is greater than B, and arithmetic computations.
  3. Primary Storage - often called 'main memory', is the area in which program instructions reside that are directing the operation of the computer at a given moment.
- The size of a computer is generally stated in terms of amount of primary storage.
- Micro computers usually have 4K to 64K bytes of primary storage.
  - Bytes contain one character.
  - 'K' denotes 1,000 bytes of storage.
- Mini computers range in size from 64K to 2 Megabytes.
  - A Megabyte denotes one million bytes.
- Maxi computers have from 64K to 20,000 Megabytes of primary storage.

b. Peripheral Devices.

- Units attached to the CPU to input and output instructions and data to and from primary storage.
- Most commonly used peripheral devices:
  1. Magnetic tape - relatively inexpensive medium of storage of programs and data. Major disadvantages include slow data transfer to and from the CPU and only sequential access of data.
  2. Magnetic disk - relatively expensive medium of storage of programs and data. Fast data transfer and random access of information mark

the major advantages of magnetic disk. Relatively high in cost.

3. Card reader/punch - The first widely used method of data transfer, these devices are rapidly being replaced by visual display terminals as input/output computer devices.
4. Cathode Ray Tube - commonly known as CRT's, these devices have the advantage of allowing fast entry and retrieval of data and programs. CRT's can be connected to CPU's that are miles away by use of telephone lines.
5. Printers - range widely in price and capabilities. Speeds vary from 30 characters per second to 20,000 lines per minute. Least expensive are called thermo printers. Most commonly used are impact types and the fastest are ink jet and laser printers.
6. Optical Scanning Devices - units that sense pencil marks on paper.

3. How the computer works.
   a. The CPU through it's three major compenents performs the manipulation of data that is inputted from peripheral devices.
   b. Data and program instructions are stored on peripheral devices, i.e. magnetic tape, magnetic disk, punched cards, until required for specific applications.
   c. Program instructions control data transfer, manipulation, and report formating.
   d. Resultant calculations and extracted data can be listed on a printer (hardcopy) or a CRT.

B. Software
   1. Inventory Control
   2. General Ledger.
   3. Payroll.
   4. Word Processing and Scheduling.
   5. Production Control
   6. Purchasing.

II General Information
   A. Micro computers.
      1. Configuration.
         a. CPU with keyboard.
         b. Visual display device.
            - some units use a television set for visual display

c. Cassette tape recorder.
d. Floppy and hard magnetic disk drives available.
e. Thermo and impact printers.

2. Capabilities.
   a. Relatively slow but adequate for small operations.
   b. Limited data storage, but new hard disks will improve storage capabilities.
   c. The on-data processing person can learn to use with minimum effort.

3. Applications.
   a. Small business and professional offices.
      - General Ledger.
      - Payroll.
      - Customer information files.
      - Word processing.
      - Purchasing.
   b. Education.
      - Testing.
      - Classroom demonstrations.
      - Student tracking.
      - Simulations.
      - Resource sharing.
   c. Home.
      - Personal finances.
      - Records.
      - Home security.
      - Games.
      - Education.

4. Maintenance.
   - On site maintenance contracts usually not available.
   - Low maintenance costs.
   - Equipment reliability can be marginal with less expensive components.

5. Operation.
   - Manuals provide step by step procedures to learning that are designed to train the novice user.
   - Learning to use micro computers is often enjoyable.

6. Equipment availability.
   - Usually in stock in neighborhood computer outlets.
   - Lead time of 4 to 8 weeks necessary often on releases of new equipment.
7. Cost.
   - Complete micro computer units range in price from $500 to $5,000 not including printers. Printers are priced from $400 to $5,000.
8. Vendors.
   - Usually neighborhood computer retail stores.

B. Mini computers.
   1. Configuration.
      a. Equipment size usually requires the dedication of a room for the placement of the mini computer.
      b. Some equipment requires special wiring and air conditioning.
      c. Magnetic tape drives are reel to reel with some use of the casette tape unit.
      d. Uses both floppy and hard disk drives.
      e. Up to 64 CRT units may be supported by mini computer with large primary storage sizes.
   2. Capabilities.
      a. Extremely fast calculating speeds.
      b. Fast data manipulation.
      c. Data storage sufficient for most small and medium size business operations.
   3. Applications.
      a. Heavy use in science and research.
      b. Increasing number of users in small to medium size business and professional operations.
         - General Ledger.
         - Payroll.
         - Customer information files.
         - Word processing.
         - Inventory control.
         - Statistical analysis.
         - Purchasing.
         - File maintenance.
         - Modeling simulations.

4. Maintenance.
   On site maintenance contracts always available.
   - Maintenance contracts vary greatly in costs depending on equipment and maintenance schedules.
   - Maintenance available on site on a 7 day, 24 hour basis.
   - Mini computer equipment reliability varies with manufacturer, and it is advisable for purchasers to contact current users of equipment.
5. Operation.
   - Requires special training for personnel to operate.
   - Training costs are usually expensive, i.e., $500 per week.
   - Usually necessary to hire personnel to operate the computer.
6. Equipment availability.
   - 60 to 90 days for most mini computer manufacturers.
7. Cost.
   - Range from $5,000 to $500,000.
8. Vendors.
   - About 10 major mini computer manufacturers.
   - Most large manufacturers have regional offices around the country.

C. Maxi computers.
1. Configuration.
   - Equipment size requires remodeling a large room for placement of new equipment.
   - Special wiring and air conditioning required for many maxi computer units.
   - Large numbers of peripheral devices are usually attached, i.e. banks of magnetic disk and tape drives.
   - Uses reel to reel magnetic tape drives for most tape applications.
   - Printers are usually very fast because of applications to which maxi computers are placed.
2. Capabilities.
   - Unlimited applications because of size.
   - Very fast manipulation of data and arithmetic computations.
   - Massive amounts of data storage available on most systems.
3. Applications.
   - Large business and educational institutions.

- Distributed computing. (A central computer serving regional sites across the country).
- Most business functions can be handled by large maxi computer installations.

4. Maintenance.
   - On site maintenance contracts readily available.
   - Maintenance contracts vary in costs depending on equipment and maintenance schedules.
   - High reliability of equipment.
5. Operation.
   - Requires special training of operations personnel.
   - Training can often be done 'in house' by companies own experienced personnel.
   - Large staff required for on-going operation of maxi computer sites.
6. Equipment availability.
   - 6 month to two year delivery of equipment is not uncommon.
7. Cost.
   - Range from $500,000 - $5,000,000.
8. Vendors.
   - Many large, reputable manufactures around the world.
   - most manufactures have regional offices around the country.

Being a Purchasing Manager, your first direct question will be "how can a computer make my department more productive"? Save me dollars?

The areas of purchasing we will be high lighting here will be: 1) issuing of purchase orders, 2) expediting, 3) inventory control.

Under a manual operation valuable labor hours are wasted in the routine function of typing and issuing purchase orders. If your department issues 50 - 100 purchase orders per day this could take between 1 to 2 full time clerk typists a full day just typing the orders. This same function could be processed by the computer in just a few minutes, eliminating most of the costly human errors.

How many hostile telephone calls or personal visits have we handled as Purchasing Managers because shipments are late? Purchasing is always the goat but never the hero when expediting is involved. When is a product due? When is it late? When should I call the vendor? Trying to handle volume purchases

through a manual expediting system is not only a nightmare, it is virtually impossible.

A computerized printout can give you detailed information on a timely basis centering around urgent items, not so urgent items, or casual items. Various systems can be developed to inventory EOQ's or just based upon a time element. The control afforded for outdated purchase orders, unwanted merchandise, and, most importantly, "needed" merchandise is invaluable.

One of the largest concerns today in the educational field is control of fixed assets inventory. A school the size of the College of DuPage, with over 15,000 fixed assets at a worth of $6,000,000 makes it imperative for sound controls for Federal and State audits, capital utilization, budget preparation and insurance purposes, to name a few.

A good computerized inventory system will give you access to your assets by location, description, value, replacement cost, departmental responsibility, age, etc.

The responsibilities and challenges of today's Purchasing Manager are an enormous burden. To successfully cope with the expanding work load of the department, automation is inevitable.